

**WHAT IS CLAIMED IS:**

1. A fuel cell stack simulator system comprising:

an air flow field supplied with air and exhausting remains of the supplied air after heating the supplied air and reducing the pressure of the supplied air;

5 a fuel flow field supplied with fuel gas and exhausting remains of the supplied fuel gas after heating the supplied fuel gas and reducing the pressure of the supplied fuel gas;

a coolant flow field supplied with coolant and exhausting the supplied coolant after heating the supplied coolant and reducing the pressure of the coolant;

10 a moisture-supplying field for supplying moisture into the fuel cell stack simulator;

an air-consuming field connected to the air flow field for reducing the pressure of heated air in said air flow field; and

a fuel-gas-consuming field connected to the fuel flow supplying field for  
15 reducing the pressure of heated fuel gas in said fuel flow field.

2. The fuel cell stack simulator of claim 1, wherein each of the air flow field, the fuel flow field, and the coolant flow field includes a control valve for reducing the pressure of flow therethrough, and a heater for heating the flow therethrough.

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3. The fuel cell stack simulator of claim 1, wherein each of the air flow field, the fuel flow field, and the coolant flow field is provided with a temperature sensor and a pressure sensor disposed in an inlet and an outlet thereof.

4. The fuel cell stack simulator of claim 2, wherein each of the control valves is controlled based on the pressures detected by the pressure sensors.

5. The fuel cell stack simulator of claim 2, wherein each of the heaters is  
5 controlled based on the temperature detected by the temperature sensors.

6. The fuel cell stack simulator of claim 1, wherein each of the air-consuming field and the fuel-gas-consuming field has a mass flow meter for detecting the flow rate, and a pump for deriving a portion of the flow thereof.

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7. A fuel cell stack simulator of claim 6, wherein the pump is controlled based on the flow rate detected by the mass flow meter.

8. The fuel cell stack simulator of claim 1, wherein the moisture-supplying  
15 field has a pump for introducing water, a mass flow meter for detecting the flow rate of the introduced water, a heater for heating the introduced water, and a injector for injecting the heated water into the air flow field in the form of moisture.

9. The fuel cell stack simulator of claim 8, wherein the pump of the  
20 moisture-supplying field is controlled based on the flow rate detected by the mass flow meter of the moisture-supplying field.